Or, under specific conditions, ice kernels form within the earth. 132 134
These ice kernels grow and press the upper layers of the earth into a hill, which then in the warm season collapses again. As a result a lake is frequently formed in place of the hill because of break-throughs in the earth. Generally the existence of frozen earth permits the absorption of the surface water only to a certain depth, and accordingly the rainfall for the most part must flow off on the surface. The irregular water flow of the rivers in these regions often goes back to this phenomenon. Thus the contrast between the high and low water lines is very great everywhere. At the confluence of the Shilka and the Agrun, the Amur passes, as its annual mean 1,200 cubic meters of water per second, while the minimum during the year is only 125 cubic meters per second. Heavier rainfall makes itself felt immediately in an often flood-like rise in the water being passed in the rivers. The thawing of the surface layers of the earth, especially in areas with varying morphological formations, offers the best conditions for ground flows. Thus the domain of the permafrost is the classical land for landslides and solifuction.

But, in addition to these numerous and very interesting natural 132 134
phenomena, the effects of the permafrost on man and his economy 499
must be mentioned; these effects are apparent everywhere in the permafrost domain and often bring difficulties. Through freezing the volume of the water expands, presses the ground upward in places, and causes destruction of transportation installations. Deep tears occur in the railroad line, and through these tears mud and water from deeper layers often push out, /53/ /Mapof the permafrost area:/ /54/ freezes on the surface, bursts the splits open farther, and forms high bucklings, and thus gradually the roads become unusable. With the setting in of the thawing weather, everything sinks together in mud and pulp.

In addition the roads and especially the bridges are by preference the starting points for ice building on ice. As an example [491]
Sumgin points out the road built from Bol'shoy Never on the Amur railroad, via Tyndinskiy and the Aldan gold region, to Yakutsk on the Lena. This road should be usable for trucks the entire year. Out of the entire length of 1,300 kilometer, on the southern part alone between Bol'shoy Never and Tommot, which is 728 kilometers long, 117 formations of ice on top of ice were counted in the winter of 1927-28. These formations caused serious destruction, especially on bridges which were as a result partially raised up, made crooked, and gradually

knowledge of the wealth of this region were spurs to pushing recklessly forward in the exploitation by using work camps. As a consequence, the Kolyma area today is among the most notorious regions in the Soviet Union, and is one of those most feared, because of the harshness of its climate. 135

For the opening up of this area building was done on the harbor and city of Magadan on Nagayevo Bay. The inhabitants of this city today are estimated to be 50,000. A highway was laid out to connect with the gold fields; by 1940 this highway had already attained a length of more than 700 kilometers, and it connected all the important mining centers. The road is kept usable for trucks the whole year through. The supplying of the entire area is done via the sea route, for the most part via Magadan, and for the rest from the north via the Kolyma. Since these connections, however, are closed off by ice for more than six months during the long winter, they proceeded to create a permanent land connection by building a highway from the center of the gold district to Yakutsk on the Lena. Of considerable importance for the development of this regions is also the fact that hard coal has been found on the Kolyma in the vicinity of the town of Verkhne-Kolymsk. Some Sovkhoz have been founded as a local source of supply for vegetables, milk, and fresh meat. [491]

The main gold fields lie west of the Buyunda, a /169/ right tributary of the Kolyma, primarily in the area of the Srednikan and Orotukan rivers. At first only the very productive gold streams were exploited, but then the mining of mine gold was also taken up. Mine gold is especially rich in the mountains on the Srednikan, on the Utina, and on the Khatynakh. The most important centers of the gold district are Srednikan, Orotukan, Khatynakh, and Seymchan.

Gold extraction in the Kolyma region developed as follows in comparison with the total production of the Soviet Union (Figures are in 1,000 kilograms): 316 433

	1933	1934	1935	1936	1937	1938	1939
Soviet Union	83.0	120.0	149.0	163.0	176.0	192.0	210.0
Kolyma Region	0.3	1.2	8.0	12.3	20.0	30.0	51.0
Percentage of the whole supplied by the Kolyma Region	0.4	1.0	5.4	7.5	11.3	15.6	24.3

(Table continued on following page)

496

Kansk and Nizhneudinsk, and leads via the Angara to the upper Lena, which it leaves before the mouth of the Vitim in order then to follow the Vitim to the mouth of the Kalar. The line then crosses the Kalar Massif toward the east, crosses the Olekma at the mouth of the Nyuksha, and extends to the valley of the Gilyuy, along which it runs as far as the mouth of the Gilyuy at the Zeya. Then the railroad line follows the breach valley of the Zeya through the Tukuringra Mountain Range toward the south and finally turns again toward the east. The Selemdzha is crossed at Norsk, the point at which its navigability begins, and the Bureya is crossed at Chekunda, the center of the greatest hard coal deposit in the Far Eastern region, a deposit which is just beginning to be opened up. The BAM ends in Komsomol'sk on the Amur. Various cross lines are supposed to provide a connection with the Amur Railroad, and of these two have already been completed. In its course, the BAM cuts through forested areas which are rich in wood but are still completely untouched; in the northern part of the Amur country the BAM crosses through the most important gold fields; and it opens up important deposits of natural resources. The construction difficulties are supposed to be extraordinarily great. It is a railroad of the future, and it is to be expected that gradually a belt of settlements will come into being following the railroad line; the railroad workers set up in permanent dwelling places, even now constitute the basis for such a belt of settlements.

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Since the main railroad lines and also the main water veins /188/ cross through the zone of settlements in the longitudinal direction from west to east, built up land routes in this direction are rare. The old Siberian tract, which before the construction of the Trans-Siberian Railroad crossed through the entire region in the longitudinal direction, has long since lost its significance as an overland route and today serves as a local connection. The Ussuri section is an exception. In the last few years this has been rebuilt from Vladivostok to Khabarovsk as an automobile highway with a firm understructure to supplement the railroad line. On the quality of this route a report says that approximately 18 hours are required to travel the approximately 770 kilometer long stretch in a passenger motor vehicle. Furthermore the greatest attention in the last few years has been devoted to extending this highway: above all it has been extended from Khabarovsk to Komsomol'sk and undoubtedly represents the most important highway in the Far East. Most of the remaining land routes have more the character of feeder routes; but regardless of this these routes are of great economic importance

491 and as a rule can be traveled by trucks.

Apart from the steppes of Transbaykal, where unhampered land traffic without building roads is possible throughout the year, land transportation in the Amur and Ussuri regions suffers from the great dampness of the ground and from the monsoon rains. The heavy rainfall which descends suddenly often destroys the roads and carries away the thin layers of the road bed. Where an understructure does not exist--and this is the case with most of the land routes--the routes become foundationless and become so quickly spoiled by heavy carting that using them is possible only with great difficulty. Also the high water of the rivers often tears away light bridges and by flooding breaks off the connections between the individual localities often for weeks.

Some land routes, however, have more than a local character and have the importance of overland routes. More care is also devoted to them. They are provided with a solid superstructure and good bridge installations, and, therefore, they are usable throughout the year by trucks, which are the principal means of transportation on these roads. In this connection the Kyakhta Tract should be mentioned first; formerly it had to overcome the exchange of goods with Mongolia. A western branch leads through the valley of the Dshida as far as Gorodok, the center of molybdenum extraction in western Transbaykal. From Chita a good route leads toward the north to Romanovskoye on the upper Vitim, and a second route leads directly toward the south to the upper course of the Onon to the tin mines of Khapcheranga and on the Sokhondo. An overland route of grand style takes its beginning at the Never station, which lies east of Skovorodino, and leads via the gold regions on the upper Gilyuy and Aldan to Yakutsk, the capital of the Yakut Republic.

In winter the rivers appear as valuable natural traffic routes. Their ice covering is so strong that they can carry the heaviest vehicles. /189/ The goods piled up during the summer not in the reach of the main traffic lines are then brought into the centers of the land with caravans of sleds or trucks. Even on the Amur and the Shilka long columns of motor vehicles are to be encountered during the winter.

However, already in the northern part of the Amur country all improved roads end. There begins the great wide north of the Far Eastern region, whose peculiar transportation conditions are to be treated in a special section.

361 this city almost 25 percent of the total population of the Buryat-Mongol [397] ASSR have been brought together. Ulan-Ude has the largest locomotive and railroad car factory in eastern Siberia; this factory supplies the whole Far East. Supported by the Buryat's important breeding of livestock, [253] the largest meat factory in Siberia, which produces canned meats, frozen meats, and other preserved meat goods has come into existence. The meat plant is in a position to process 400 cattle, 1,000 sheep, and 250 pigs a day. In 1940, 25 million cans of meat were sent out. Two large [323] glass factories make Ulan-Ude also the supply center for crockery and glass goods for the entire Soviet Far East. Lying on a river and a railroad, Ulan-Ude is favorably located in terms of transportation. At the [376] same time Ulan-Ude is also the center of the Selenga water transportation, for which river steamers and barks are built in the city's own dockyard. Steamers not only carry traffic downstream but also carry it up the tributaries, for example on the Chikoy, which runs through agricultural regions. Of no less great importance is the floating of lumber, since the tributaries of the Selenga come from areas rich in forests. Here [313] again the lumber streams into Ulan-Ude, where it is processed in large sawmills. Iliynsk, which lies on the Selenga 57 kilometers below the capital, is also an important wood-processing center.

133 Ulan-Ude lies at the point where the Selenga Valley unites with the valley of the Uda. As a contiguous graben depression, the two form a morphological-tectonic unit, and in their natural state, they were once a steppe. /215/ /Sketch Map of the Buryat-Mongol ASSR:/ 1 /216/ These two valleys today are the most heavily populated and economically the most important regions in the Buryat-Mongol ASSR.

Above Ulan-Ude the valley of the Selenga soon expands into a hilly to gently rolling, pure steppe landscape, which continues over 487 the border into Mongolia. It is traversed by the old caravan road, which connects Ulan-Ude with the capital of the Mongolian People's Republic, Ulan-Bator, the former Urga. At the border crossing Kyakhta (approximately 10,000 inhabitants) lies opposite the Mongolian Atlan Bulak •491 (Chinese: Maimachen). This overland route, expanded into an auto- 496 mobile highway in the period of the Soviet Union, has since 1938 been supplemented by a railroad line, which branches from the main line at Ulan-Ude but does not follow the old road. Rather it goes around Gusinoye Lake in a western arc and reaches the border at Naushki, approximately 20 kilometers west of Kyakhta. A lengthening of this 491 railroad to Urga was carried out in 1949. A land route usable throughout the year by trucks branches off from Novo Selenginsk toward the west into the river area of the upper Dzhida.

316 Land road connections also exist toward the south via Romanovskoye
[491] on the Vitim to Chita. A rapid and continuous means of transportation
509] has recently been ensured by an airline, which is flown regularly and which connects Chita with Tsipikan, the center of the northern gold district.

133 To the north of the Tsipa-Bambuyka valley rises the Muya mountain country, which is divided into two long ridges by the river of the same name which flows toward the northeast to the Vitim. These two long ridges are the Southern Muya Mountain Range and the Northern Muya Mountain Range. The northern border of the latter is formed by the extended valley of the Upper Angara, which flows toward the west-southwest to Lake Baykal.

The Southern Muya Mountain Range, a mighty, massive horst, forms the watershed between the Tsipa and the Muya. It has a raw, wild appearance with a ridge of numerous gol'tsy, with an entire series of heights, crowned with snow, rising over 2,000 meters. The picture of the entire mountain range, however, is not unified, and the wealth of varying forms is determined by the change in the rock. The former root surface is, to be sure, heavily destroyed, but it is still always recognizable. In the higher places traces of an old glaciation are to be found everywhere in the form of circus /circular?/ valleys/Zirkustäler/, trough valleys, round basin lakes /Karseen/ and basin moors /Karmooren/, and, in the valleys, deposits of boulders and rubble. Because the Muya Valley lies at the slight altitude of 450 to 600 meters, the slope toward the north is much sharper than the slope toward the south to the Tsipa Valley, which generally has a height of more than 900 meters. The passes are difficult, small in number, and 1,450 to 1,700 high. From the swamps at the foot of the mountain range rise slopes covered with thick taiga. Here the ascent into the narrow valleys overgrown with shrubs is especially difficult. Only at heights where the vegetation discontinues, is there an opportunity for free movement.

The valley of the Muya is determined tectonically as a depression. It attains a width of up to 30 kilometers. A mixture of deposits of old and recent date makes the valley plain appear rich in variety. Hills, long embankments, sand bars with closed off lakes, in between swamps and moors displace one another. Terrace formations on the border of the valley and widely diffused lake sediments permit the basin of a former lake to be recognized in the valley.

The Northern Muya Mountain Range, likewise a horst, is

133 permafrost, however, create great difficulties. Development of the area is hampered by the area's remoteness and the difficulty of gaining access to it, since the break-through valley of the Zeya toward the [505] south represents the sole gateway to the depression. To date the supplying of the area has been done on the water route as far as the locality of Zeya, for the Zeya River is navigable to this point. The [491] supplies are then brought by vehicles further up the river. The area around the upper course of the Gilyuy is crossed by the highway from Never to Yakutsk. This highway crosses the Tyndinsk, a tributary of [496] the Gilyuy, at Tyndinsk. The new Baykal-Amur Railroad, coming from the Nyukzha valley, is also supposed to enter the valley of the Gilyuy at the same place and to follow the Gilyuy as far as the Zeya, in order then likewise to use the Zeya's break-through valley as an exit toward the south. The laying of this railroad line through the Zeya-Gilyuy depression is expected to lead not only to better opportunities for exploiting the gold fields but also to the use of the rich supplies of wood in the forests, and finally also to better settlement of the area.

/240/ The depression of the upper Zeya and Gilyuy is cut off into a vast basin on the south by a watershed mountain chain. The Zeya is the sole river flowing off to the south in this basin. This mountain chain is regarded as a continuation of the Daur and the Shilka mountain ranges; it stretches from Transbaykal via the Olekminsk Stanovik to the depressions of the Amgun (left tributary of the lower Amur) (207). This entire line of mountain ranges was, according to

207. Tanfiliev, G.I., Geografiia Rossii: Relief Aziatskoi Rossii /Geography of Russia: The Relief of Asiatic Russia/, 2 vols., (Odessa, 1923), p. 250.

Ahnert (16), formed partly by faulting but principally and especially

16. Anert /sic/, E.E. Kratkii geologicheskii ocherk Priamuria /Short Geological Sketch of the Amur Region/. Geological Research in the Gold Regions of Siberia, Vol. XVII. Petersburg, 1913.

on the southern edge, by break formations. Within the Oldoy-Zeya Highland the chain of mountain ranges begins in the west with the Yankan Mountain Range, which lies between the upper courses of the

133 northern edge it represents.

The Oldoy Highland is the smallest part of the region as a whole, and it comprises the area between the Yankan Mountain Range and the Amur. Already from the region around the source of the Oldoy toward the south the landscape flattens out and dissolves into individual ridges, mountains, and valley areas, giving the overall impression of a mountainous and hilly landscape. Toward the southeast, between the Urkan and the Amur, the broad hill ridges gradually disappear altogether, and the landscape here flows into the so-called Amur-Zeya plateau, which already belongs to the greater landscape of the Zeya-Bureya plain area.

491 The Oldoy Highland is traversed in the north by the Amur
496 Railroad, from which a railroad line to the Amur harbor of Dzhalinda branches off in Skovorodino (more than 20,000 inhabitants), the seat of a railroad office. Thus, in terms of transportation, this region is quite well opened up. This is also true of the most heavily populated parts within the overall region. The alluvial sands of the rivers to the north of the Amur Railroad, especially the valleys of the upper Oldoy, and of the Great and Lesser Urkan, are rich in gold. The built-up highway which is mentioned above and which can be used throughout the year, leads from the station of Never (around 10,000 inhabitants). This highway crosses the Tukuringra Mountain Range and the Stanovoy in its western part and goes via the Aldan gold fields to Yakutsk. It reaches Tyndinsk in the area around the upper course of the Gilyuy. This important highway has recently been supplemented by a railroad line from Skovorodino to Tyndinsk, where there is a spur to the great Baykal-Amur Railroad (BAM). With this a direct cross-connection between the Amur shipping and the BAM is supposed to be created. The new railroad line, in addition, opens up new areas for settlement, just as the construction of the Amur Railroad has become a pacemaker for heavier settlement by an agricultural population. Also in the less swampy valley areas between the railroad and the Amur River agriculture is
361 pursued relatively actively. Accordingly, a lively food industry and also machine building shops and repair shops have been able to develop in Skovorodino, which has already been named as the center of the Oldoy Highland. Brown coal, which is mined in the vicinity, is used as the raw material for energy. To the north of the city tin supplies
[509] have been determined. An airfield in the vicinity connects Skovorodino to the great airline running from Moscow to Khabarovsk to Vladivostok.

137 The mountain ridges themselves are either bare or have underbrush and reindeer moss growing on them.

361 563 As a consequence of the contrasts between the protected valley areas and the ridges covered with moss tundra, the hinterland of the coast here is occupied far more by Tungus reindeer nomads than the Dzhugdzhur coast. Also, despite the northern location, the number of coastal localities is larger here than there. Russians, however, are to be found here less often. These localities are predominantly occupied by sea Tungus, who, however, all cultivate some vegetables and potatoes in addition to their fishing. Also--a fact that is especially noteworthy--they follow the Russian example and keep cattle and horses. However, the opportunities which are available here for breeding livestock have still not been long exploited, and thus there are the most favorable prospects here, especially since sufficient hay fields are on hand to assure the supply of winter fodder. The most important localities on the coast are Tauysk, Ola, Yamsk, and Gizhiga, all of which lie at the mouths of the rivers of the same [505] names. During the summer, connection between these localities is [487] maintained by small coastal steamers; during the winter the connection is over the so-called coastal route which leads from Okhotsk along the coast to Kamchatka and which is traveled by horse, reindeer, and dog sleds. All of these coastal localities, however, are exceeded in importance by the newly founded city of Magadan, which came into being only shortly before the last world war and which has already far surpassed the old Okhotsk as a harbor.

135 Magadan owes its founding and its rapid growth above all to the hinterland which is rich in natural resources. Here in the area around the upper course of the Kolyma extraordinarily rich gold fields have been discovered; mine gold as well as gold streams have been found. A more exact exploration of the region showed the existence of hard coal and significant supplies of less common elements. The 361 exploitation, which was taken up rapidly, led to the formation of numerous new localities, and thus there are now more than 50 settlements in the upper Kolyma region. The centers of industrial life lie in the area around the source of the Kolyma and on its tributaries, the Berelyakh and Tenka. The most important of the new localities are Orotukan and Khatynakh. For connection with the outside world 491 a highway was built which can be used throughout the year; this highway leads from Ust'-Utinaya to Magadan on the coast. Since the Kolyma is navigable from Ust'-Utinaya on, this highway has at the

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same time created the shortest connection with the entire Kolyma region. The highway is more than 1,000 kilometers long and was built under the most difficult of conditions (mountain ranges, permafrost). Bases connected with small agricultural economies /290/ facilitates the use of the road. The harbor of Magadan lies on Nagayevo Bay. Steep rocks are artificially heaped up at the foot of the landing places for sea-going ships. Ice breakers are employed in the harbor to make it possible to use the harbor for a longer period. The rapidly growing city, which in 1939 already had more than 10,000 inhabitants and today is estimated to have 50,000 inhabitants, lies somewhat at a distance from the harbor and is separated from it by a flat, rocky hill. The construction of the city was done with the most modern means. They have even succeeded in building stable six-story skyscrapers, despite the permafrost, by using deep excavations and by laying in insulating layers.

361 [504]

The Provinces of the Extreme Northeast

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These regions are bordered on the west by the Kolyma Mountain Range, and they are divided into the Chukchi Peninsula, the Anadyr' and Penzhina region, and the Koryak Mountain Range. Of these areas only the strip along the coast is better known; the vast interior, on the other hand, is mostly still insufficiently explored.

The Chukchi Peninsula is cut off from the Asiatic contintent on the one side by Chaun Bay on the Arctic Ocean and on the other side by Anadyr' Bay on the Bering Sea. The southern border is formed by the Anadyr' Mountain Range, which represents the watershed between the Arctic Ocean rivers and the Anadyr', and which is more than 1,000 meters high. The region north of the Anadyr' Mountain Range is also filled with lines of mountain ranges almost as far as the coast of the Arctic Ocean. These mountain ranges stretch in a direction from west to east. Further toward the east the contiguous, broad mountain landscape is lost, and the mountain ranges form themselves into two ridges which lie under 800 meters and which, broken through several times by rivers, reach the east coast with the northern mountain range going in the direction of Cape Dezhnev. The cape itself, which lies 77 kilometers from the mainland of Alaska, consists of a single, massive mountain which is 770 meters high and which is formed from limestone. This mountain is completely isolated and is connected with the mainland only by a low, narrow tongue of land, which is

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by Nishikov's private hunting preserve. Near by, the prisoners of the invalid camp called 'Seventy-second Kilometer' work in a glass factory which is under the special protection of Gridassova and consequently always registers a marvelous production record. During the War burnt-out electric bulbs were repaired there, since new bulbs were almost unobtainable and even tiny bulbs were sold at a hundred and fifty rubles."[11]

433

7) The Kolyma Buildup (1932-1946): As has been indicated earlier, Magadan and the entire Kolyma area were almost uninhabited in 1932 when the expedition under Berzin reached Nagayevo port; however, although at a fantastic cost in human lives, remarkable development of the Kolyma area was made. As early as 1946 it was clearly known that Dalstroy's extensive and many-sided activities were coordinated in a system of administrative organizations, each of which deals with a specific section of the region's economy--the centers of all these organizations are located in Magadan. At that time the following were known to exist: administrations of supplies, fish industry, coal, wood manufacturing industry, road building, agriculture, motor transport, and a few others. Essentially these administrations have the same task--they must insure uninterrupted operation and success in the chief industry of the region--gold mining, and with this ultimate goal in mind, they must supply all necessary materials and products. The ideal situation, as desired by Dalstroy and no doubt by Moscow as well, seems to be for Magadan to be completely self-sufficient and to turn over to the state all gold mined. As far as the fishing industry is concerned, it is known that fish is exported from Kolyma to Vladivostok. Attempts have been made to extract oil locally to supply motor transport in the region; however, there has been little success in this project although the presence of oil deposits in the area has been definitely established.

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Road construction was one of the primary tasks upon the initial efforts in Kolyma; just before World War II, another spurt in road building occurred. In 1939 the administration of road building was split into two independent organizations, one for the south and one for the north. By that time, the trunk highway from Magadan to Seimchan was being extended in the direction of the newer gold fields on the upper Indigirka River, and a number of side roads were also constructed to connect the main gold fields on the upper Kolyma River with the highway. Altogether, according to the best estimates, there were approximately 901 kilometers of paved roads in actual use at that time. However, this was inadequate, and in 1939-1940 a new plan of extensive road building was drawn up covering the construction of new roads in the extreme north, at the Kolyma estuary, and in the south, on the upper Kolyma, in the so-called "old" gold mining districts. In addition to new tributary roads, work was started in 1939 on the construction of a second motor highway from Dresva Bay on the Sea of Okhotsk to the gold-mining territory on the upper Kolyma. Even far more reaching were the plans for road construction east of the Kolyma estuary, in the tundra of the Arctic coastal region, down to the Bering Strait, where geological exploration had discovered gold fields of exception richness, perhaps exceeding those of the upper Kolyma. There have been no exact data concerning these plans; understandably, the information coming from the deep interior of the Kolyma region is generally far more scant than that coming from Magadan. However, at the beginning of the Russo-German War in 1941, all these plans for road construction were curtailed for obvious reasons. As has been indicated earlier, practically all construction activities were halted and many short-term prisoners were even sent back to European Russia where they served actively in the defense of the Soviet Union. In connection with the construction of roads just prior to the German

11 Ibid., pp. 110-111.

491 invasion, it should be mentioned that the history of the Nagayev harbor development, as cited previously, was again repeated.

316 The actual gold mining operations were controlled by a special gold mining trust within the Dalstroy organization.[1] In 1939-1940 this trust was composed of seven administrative agencies, each in control of its own area. These agencies were

1) The Southern Mining Administration, which had jurisdiction over sixteen gold fields, including the principal fields of Srednikan, Borisikin, and others;

2) The Northern Mining Administration, which was in charge of twelve fields;

3) The Western Mining Administration, which controlled twelve fields;

4) The Southwestern Mining Administration, with eight fields under its jurisdiction;

5) The Northwestern Mining Administration, with six fields under its control;

6) The Chai-Urinsk Mining Administration, with eight fields therein; and

7) The Tenkino-Detrinsk Mining Administration, with four fields. However, it should be noted that, although these seven agencies controlled and directed the activities of 66 gold fields, some of them are spread over such large areas that they should be called groups of adjacent gold fields. Furthermore, it should be borne in mind that the fields east of the Kolyma estuary, which in 1940 were only beginning to be exploited, have not been included in the above tabulation. Information in this respect is nil.

466 The total number of prisoners who work these gold areas[1] is not known; however, according to estimates by prisoners who have managed to return after having served their terms and fled to the west, the normal number of prisoners at each field varies between 5,000 and 10,000 workers. The number reaches its highest peak in May or June of each year: the mining season begins in June at which time new groups of prisoners are arriving at Magadan from Vladivostok. However, by the end of the mining season, the total figure has again decreased due to the heavy death toll; this has been corroborated by Polish prisoners who worked in the Kolyma gold areas after the Soviet-German division of Poland. These same Polish army troops mentioned a camp on the Chukotsk Peninsula, where some 3,000 Polish troops were sent in August 1940. However, all 3,000 died while working in the lead mines, not only due to the usual bad conditions but also due to lead poisoning. Therefore, assuming that the number of prisoner-workers per field averages some 5,000 persons, there is reason to believe that there were at least 330,000 prisoners engaged in gold mining activities in Kolyma. Of course, this figure represents only an estimate for the known gold fields; however, it should be remembered that this total will be swelled by the numbers of women prisoners who are engaged in various other activities like agriculture, lumbering, among others. (Note: No reference has ever been noted where women prisoners have been utilized in the gold fields.) Furthermore, since vast new areas have been in the process of exploitation, including the construction of roads, it goes without saying that additional large number of prisoners are utilized for this purpose; also, there are other mining areas, such as those east of the Kolyma, whereat no doubt large numbers of prisoners are also engaged. Consequently, although no exact figures

[1] [i.e., the Kolyma region, Siberia -- Analyst]